

**La Salle College High School
AP Chemistry
Summer Homework Assignment**

**DUE on first day
of class! Email me with
questions as a last resort:
stottm@lschs.org**

Name: _____

1. Metric Conversions. Remember $1 \text{ cm}^3 = 1 \text{ mL}$ $1 \text{ L} = 1 \text{ dm}^3$

GIVEN METRIC UNIT	DESIRED METRIC UNIT
1.42 cm	mm
$1.21 \times 10^2 \text{ cm}$	m
674.5 nm	cm
$2.345 \times 10^4 \text{ m}$	km
809 mL	L
$8.201 \times 10^{-7} \text{ L}$	nL
256000 cm^3	L
$4.15 \times 10^{-10} \text{ L}$	cm^3
$9.10 \times 10^{11} \mu\text{g}$	g
0.006793 kg	mg

2. Would you expect the following atoms to gain or lose electrons when forming ions? What ion (symbol and charge) is most likely in each case?

ELEMENT	GAIN OR LOSE	ION FORMED
Li		
Mg		
N		
S		
Cl		
Al		

3. Chemical Nomenclature: You should be able to complete this using a periodic table and MINIMAL help from other sources.

ITEM	CHEMICAL FORMULA	CHEMICAL NAME
A	KBr	
B	MgS	
C	Al ₃	
D		Strontium fluoride
E		Potassium nitride
F		Magnesium phosphide
G	Hg ₂ O	
H	FeBr ₃	
I	CoS	
J	TiCl ₄	
K		Tin (II) nitride
L		Cobalt (III) iodide
M		Mercury (II) oxide
N		Chromium (VI) sulfide
O	SrSO ₃	
P	LiNO ₂	
Q	KMnO ₄	
R	K ₂ Cr ₂ O ₇	
S		Chromium (III) hydroxide
T		Magnesium cyanide
U		Lead (IV) carbonate
V		Ammonium acetate
W	N ₂ O ₄	
X	ICl ₃	
Y	SO ₂	
Z	P ₂ S ₅	
AA		Diboron trioxide
BB		Arsenic pentafluoride
CC		Dinitrogen monoxide
DD		Sulfur hexachloride
EE	HC ₂ H ₃ O ₂	
FF	H ₃ PO ₃	
GG	HCl	
HH		Hydrofluoric acid
II		Sulfurous acid
JJ		Phosphoric acid

4. Chemical Reactions – Write and BALANCE the following reactions.

a. Glucose ($C_6H_{12}O_6$) reacts with oxygen gas to produce gaseous carbon dioxide and water vapor.

b. Solid iron (III) sulfide reacts with gaseous hydrogen chloride to form solid iron (III) chloride and hydrogen sulfide gas.

c. Carbon disulfide liquid reacts with ammonia gas to produce hydrogen sulfide gas and solid ammonium thiocyanate (NH_4SCN).

d. Aqueous solutions of lead (II) nitrate and sodium phosphate are mixed resulting in the precipitate formation of lead (II) phosphate and aqueous sodium nitrate as the other product.

e. Solid zinc reacts with aqueous hydrochloric acid to form aqueous zinc chloride and hydrogen gas.

f. Aqueous calcium hydroxide is neutralized by aqueous phosphoric acid to produce solid calcium phosphate and water.

5. Chemical Calculations – You must show the work (on a separate sheet of paper) that leads to your answer to receive credit. Write your answers in the blanks to the left of the question.

Remember that:

$$1 \text{ mole element} = 6.022 \times 10^{23} \text{ atoms}$$

$$1 \text{ mole compound} = 6.022 \times 10^{23} \text{ molecules or formula units}$$

❖ *molecules refer to covalent compounds while formula units refer to ionic compounds (mathematically they mean the same thing)*

Chloral hydrate ($\text{C}_2\text{H}_3\text{Cl}_3\text{O}_2$) is a drug formerly used as a sedative and hypnotic.

- _____ (i) Calculate the molar mass of chloral hydrate.
- _____ (ii) How many moles of chloral hydrate molecules are in 500.0 g of chloral hydrate?
- _____ (iii) What is the mass in grams of 2.00×10^{-2} mol chloral hydrate?
- _____ (iv) What number of chlorine atoms are in 5.00 g chloral hydrate?
- _____ (v) What mass of chloral hydrate would contain 1.00 g Cl?
- _____ (vi) What is the mass of exactly 500 molecules of chloral hydrate?

6. You should also know ALL of the polyatomic ions on the next page. Pay attention to those ions ending in –ite versus –ate. You can expect mixed-up polyatomic ion quizzes the first week of school, followed by another week of daily formula-writing quizzes.

Helpful Tip: compare the polyatomic ions for the following halogens (notice what changes and what stays the same). Notice that fluorine is NOT include – it does not form polyatomic ions.

$(\text{ClO})^{-1}$ HYPOCHLORITE	$(\text{BrO})^{-1}$ HYPOBROMITE	$(\text{IO})^{-1}$ HYPOIODITE
$(\text{ClO}_2)^{-1}$ chlorite	$(\text{BrO}_2)^{-1}$ bromite	$(\text{IO}_2)^{-1}$ iodite
$(\text{ClO}_3)^{-1}$ chlorate	$(\text{BrO}_3)^{-1}$ bromate	$(\text{IO}_3)^{-1}$ iodate
$(\text{ClO}_4)^{-1}$ perchlorate	$(\text{BrO}_4)^{-1}$ perbromate	$(\text{IO}_4)^{-1}$ periodate

POLYATOMIC ION NAME	SYMBOL and OXIDATION NO.
Ammonium	NH_4^{+1}
Acetate	$\text{CH}_3\text{COO}^{-1}$ or $\text{C}_2\text{H}_3\text{O}_2^{-1}$
Cyanide	CN^{-1}
Hydrogen carbonate	HCO_3^{-1}
Hydrogen sulfate	HSO_4^{-1}
Hydroxide	OH^{-1}
Nitrate	NO_3^{-1}
Nitrite	NO_2^{-1}
Hypochlorite	ClO^{-1}
Chlorite	ClO_2^{-1}
Chlorate	ClO_3^{-1}
Perchlorate	ClO_4^{-1}
Permanganate	MnO_4^{-1}
Iodate	IO_3^{-1}
Thiocyanate	SCN^{-1}
Oxalate	$\text{C}_2\text{O}_4^{-2}$
Carbonate	CO_3^{-2}
Chromate	CrO_4^{-2}
Dichromate	$\text{Cr}_2\text{O}_7^{-2}$
Sulfate	SO_4^{-2}
Sulfite	SO_3^{-2}
Thiosulfate	$\text{S}_2\text{O}_3^{-2}$
Arsenate	AsO_4^{-3}
Phosphate	PO_4^{-3}
Phosphite	PO_3^{-3}